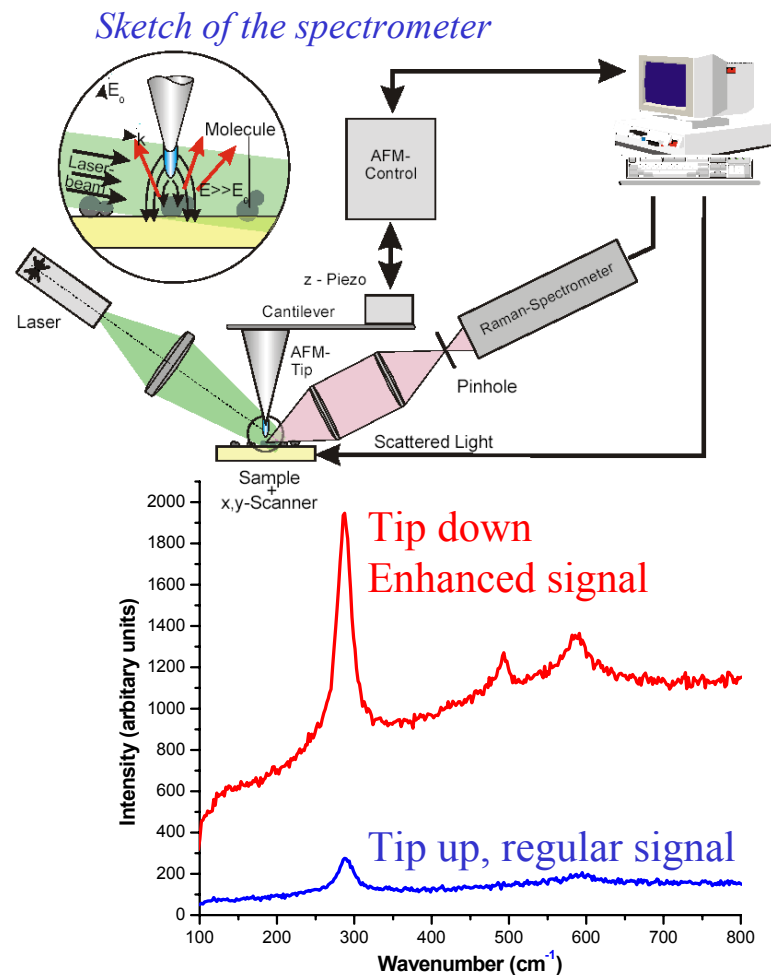


Development of Scanning Nano-Raman Spectroscopy

A.P. Sokolov and M.D.Foster , University of Akron, DMR-0215966

Development of a New Technique for Materials Analysis at the Nanoscale, scanning nano-Raman spectroscopy, is the goal of the project. Using modified tips of an atomic force microscope (AFM), we obtained significant enhancement of the Raman signal localized to ~ 30 nm. The enhancement has been observed for a variety of materials, including semiconductors, carbon nano-tubes, polymers and molecular systems. The observation of enhancement for such a broad range of materials is clear evidence that the technique under development can find broad application in various fields of nano-science, including the analysis of structure, chemical composition, conformations and stresses with nanometer lateral resolution.



Tip-enhancement Raman signal from quantum dot material (CdS).

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Education: The training of students is a strong component of the project. Five graduate students, M. Duda, D. Mehtani, N. H. Lee, S-H. Moon and R. Hartschuh and a postdoc Dr. Kisliuk were actively involved in this research. During summers 2003 and 2004 two undergraduate students, R. Greytag and K. Hill, worked on the project. Special attention has been paid to the involvement of students from underrepresented groups. Kendra Hill (REU 2004), a black female undergraduate, presented a poster on her summer's research at the Northeast Ohio Undergraduate Research Symposium on Polymer Science and Engineering. She is shown here informally describing her poster to a graduate student from Dr.

Foster's group.



Outreach: The PhD students in Dr. Sokolov's and Dr. Foster's groups were involved also in teaching middle school and high school students through the District 5 Science Fair and the University of Akron Math and Science Upward Bound Program for disadvantaged high school students.